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(56) Documents Cited

**GB 2217233 A GB 2122545 A GB 2061764 A  
GB 0997912 A GB 0700743 A EP 0428489 A**

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(54) Coated Paper

(57) A coated paper useful for the manufacture of security documents to prevent forgery or counterfeiting comprises a base paper having an opaque first coating for preventing see through and a second coating providing a surface suitable for printing.

The opaque coating comprises a black pigment.

The paper is especially suitable for scratch cards such as lottery tickets.

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## **COATED PAPER**

This invention relates to coated paper useful for the manufacture of security documents to prevent forgery or counterfeiting. The invention has particular application for the manufacture of tokens, tallies, tickets or the  
5 like, and especially scratch lottery tickets having an abradable top coating that can be removed to reveal printed information.

In the manufacture of scratch lottery tickets, it is important that the printed information is concealed so as to prevent detection by inspection of the ticket without removing the top coating. The coated paper used must be  
10 opaque and resistant to tampering.

According to the present invention we provide a coated paper useful for the manufacture of security documents wherein at least one face of a base paper has applied thereto an opaque first coating for preventing see through and a second coating which provides a surface suitable for printing.

15 The base paper can range in weight from 70 to 300gm<sup>2</sup> and is preferably composed cellulosic fibres. The nature of these fibres is dependent on the pulping process which can be mechanical and/or chemical.

The base paper may consist of between 60% and 100% recycled fibres either pre- or post- consumer waste. The fibres may be short grain which  
20 are particularly effective for lower weight products, typically between 100 and 180gm<sup>2</sup>. Alternatively, the fibres could be long grain up to 100%.

The base paper is preferably selected to have a low resistance to tear as measured by the Taber Tear Tester. The selection of fibre morphology with low tear resistance provides a security feature which is of particular  
25 benefit in the manufacture of lottery tickets by preventing the forger from safely delaminating the ticket and transferring the printed information. The likelihood is that either the ticket will be permanently damaged or unusable.

As a further security feature, the base paper may include a chemical or compound which, if the ticket is torn but glued back together, can be used  
30 to reveal the tear. For example, the base paper may include a fluorescent brightener such as a derivative of stilbene.

The base paper is preferably white and, in addition to cellulosic fibres, may include at least one pigment and/or at least one filler preferably up to a limit of 25% by dry weight. Typical pigments and fillers include  
35 clays, calcium carbonate, kaolin, talc and titanium dioxide.

The base paper may also include as processing chemicals one or more selected from the group comprising retention aids, wet strength additives and flocculants.

5 The use of a white base paper has a number of advantages compared with an opaque coloured base paper. Firstly, the chemicals used by the recycler in the de-inking of waste can be reduced with obvious environmental and commercial benefits. Secondly, a paper mill which has to produce a large quantity of base paper to be commercially viable can supply white base paper to different companies for subsequent coating according to the  
10 particular application of the paper with obvious economic and commercial benefits.

The opaque first coating preferably includes at least one colouring pigment which either absorbs or scatters incidental light to render the paper opaque and prevent see through.

15 Preferably the first coating is coloured black and examples of suitable formulations are:-

<b>Example 1</b>	<b>(% by dry weight)</b>
Clay	60-75
Black Pigment	2-10
Binder	10-30
Co-Binder	0-2
Crosslinker	0-2
Processing Chemicals	0.5-1.2

<b>Example 2</b>	<b>(% by dry weight)</b>
Calcium Carbonate	50-70
Black Pigment	2-10
Binder	10-30
Co-Binder	0-2
Crosslinker	0-2
Processing Chemicals	0.5-1.2

The second coating is preferably white or pastel shaded suitable for the application of conventional printing inks by printing techniques and examples of suitable formulations are:-

Example 3	(% by dry weight)
Titanium Dioxide	50-70
Calcium Carbonate	10-15
Binder	20-25
Co-Binder	<2
Wax	<2
Crosslinker	<1
Processing Chemicals	<3

5

Example 4	(% by dry weight)
Titanium Dioxide	40-65
Calcium Carbonate	10-15
Ropaque OP-62LOE (Synthetic opacifier ex. Rohm and Haas)	20-30
Binder	15-20
Co-Binder	<2
Wax	<2
Crosslinker	<1

As binders and co-binders one or more selected from the group comprising acrylic polymers, styrene-acrylic co-polymers, styrene-acrylic-butadiene ter-polymers, styrene-butadiene co-polymers, casein and starch based systems may be used.

As processing chemicals one or more of dispersants, surfactants and anti-foaming agents may be used.

As crosslinkers one or more selected from the group comprising urea formaldehyde, melamine formaldehyde and epoxy based resins may be used.

The opaque first coating is preferably applied to a grammage of between 7 - 12gm<sup>2</sup> of dry solid matter and the second coating is preferably applied to a grammage of between 10 and 30gm<sup>2</sup> of dry solid matter.

The pigments in the coatings are typically inorganic or synthetic. The use of synthetic pigments has both environmental benefits and processing benefits for the converter and printer.

5 If the base paper includes fluorescent materials as a security feature, the coatings are preferably non-fluorescent so as not to interfere with detection of the fluorescent materials in the base paper and to allow the use of UV fluorescent printing inks as a further security feature.

10 If the base paper does not contain fluorescent materials, the second coating may include fluorescent materials as a security feature with such materials being present in amounts up to 3% by dry weight

The same combination of first and second coatings may be applied to the reverse face of the base paper to provide a surface suitable for printing on the reverse face. Where the base paper has a low tear resistance, the opaque first coating may be omitted and the reverse face coated with the  
15 second coating only.

In the manufacture of scratch lottery tickets, information unique to the ticket is printed on the face of the base paper coated with the first and second coatings and is covered by a coloured abradable coating which the purchaser of the ticket can remove to reveal the information. The reverse  
20 face of the base paper may be coated with the first and second coatings or the second coating only and can be printed with general information and instructions relating to the lottery.

It will be understood that the invention is not limited to the manufacture of lottery tickets and that the coated paper may be used to  
25 provide security against fraud or counterfeiting in other documents, for example entry tickets, security passes.

Claims:

1. A coated paper useful for the manufacture of security documents wherein at least one face of a base paper has applied thereto an opaque first coating for preventing see through and a second coating which provides a surface suitable for printing.
2. A coated paper according to Claim 1 wherein the base paper ranges in weight from 70 to 300gm<sup>2</sup>.
3. A coated paper according to Claim 1 or Claim 2 wherein the base paper is composed cellulosic fibres.
4. A coated paper according to any one of the preceding Claims wherein the base paper consists of between 60% and 100% recycled fibres either pre- or post- consumer waste.
5. A coated paper according to Claim 3 or Claim 4 wherein the fibres are short grain.
6. A coated paper according to Claim 3 or Claim 4 wherein the fibres are long grain.
7. A coated paper according to any one of the preceding Claims wherein the base paper is selected to have a low resistance to tear.
8. A coated paper according to Claim 7 wherein the base paper includes security means which, if the ticket is torn but glued back together, can be used to reveal the tear.
9. A coated paper according to Claim 8 wherein the security means comprises a chemical or compound.
10. A coated paper according to Claim 8 or Claim 9 wherein the security means includes a fluorescent brightener.
11. A coated paper according to Claim 10 wherein the brightener is a derivative of stillbene.
12. A coated paper according to any one of the preceding Claims wherein the base paper is white.
13. A coated paper according to Claim 12 wherein the base paper includes at least one pigment and/or at least one filler.
14. A coated paper according to Claim 13 wherein the pigment and/or filler is present in an amount up to a limit of 25% by dry weight.
15. A coated paper according to Claim 13 or Claim 14 wherein the pigment and/or filler is selected from the comprising clays, calcium carbonate, kaolin, talc and titanium dioxide.

16. A coated paper according to any one of the preceding Claims wherein the base paper includes one or more selected from the group comprising retention aids, wet strength additives and flocculants.

17. A coated paper according to any one of the preceding Claims wherein  
5 the opaque first coating includes at least one colouring pigment which either absorbs or scatters incidental light to render the paper opaque and prevent see through.

18. A coated paper according to Claim 17 wherein the first coating is coloured black.

10 19. A coated paper according to Claim 18 wherein the colouring pigment is present in an amount up to 10% by dry weight

20. A coated paper according to Claim 18 or Claim 19 wherein the first coating comprises:-

(% by dry weight)

15	Clay	60-75
	Black Pigment	2-10
	Binder	10-30
	Co-Binder	0-2
	Crosslinker	0-2

20 Processing Chemicals 0.5-1.2

21. A coated paper according to Claim 18 or Claim 19 wherein the first coating comprises:-

(% by dry weight)

	Calcium Carbonate	50-70
25	Black Pigment	2-10
	Binder	10-30
	Co-Binder	0-2
	Crosslinker	0-2

Processing Chemicals 0.5-1.2

30 22. A coated paper according to any one of the preceding Claims wherein the second coating is white or pastel shaded.

23. A coated paper according to Claim 22 wherein the second coating includes one or more binders and/or co-binders selected from the group comprising acrylic polymers, styrene-acrylic co-polymers, styrene-acrylic-  
35 butadiene ter-polymers, styrene-butadiene co-polymers, casein and starch.



24. A coated paper according to Claim 22 or Claim 23 wherein the second coating includes one or more of dispersants, surfactants and anti-foaming agents.

25. A coated paper according to any one of Claims 22 to 24 wherein the second coating includes one or more crosslinkers selected from the group comprising urea formaldehyde, melamine formaldehyde and epoxy based resins.

26. A coated paper according to any one of Claims 22 to 25 wherein the second coating comprises:-

(% by dry weight)

Titanium Dioxide 50-70

Calcium Carbonate 10-15

Binder 20-25

Co-Binder <2

Wax <2

Crosslinker <1

Processing Chemicals <3

27. A coated paper according to any one of Claims 22 to 25 wherein the second coating comprises:-

(% by dry weight)

Titanium Dioxide 40-65

Calcium Carbonate 10-15

Opacifier 20-30

Binder 15-20

Co-Binder <2

Wax <2

Crosslinker <1

28. A coated paper according to any one of the preceding Claims wherein the opaque first coating is applied to a grammage of between 7 - 12gm<sup>2</sup> of dry solid matter and the second coating is applied to a grammage of between 10 and 30gm<sup>2</sup> of dry solid matter.

29. A coated paper according to any one of the preceding Claims wherein the base paper is fluorescent and the first and second coatings are non-fluorescent.

30. A coated paper according to any one of Claims 1 to 28 wherein the base paper is non-fluorescent and the second coating is fluorescent.

31. A coated paper according to Claim 30 wherein the second coating contains fluorescent material(s) in amounts up to 3% by dry weight.
32. A coated paper according to any one of the preceding Claims wherein the first and second coatings are applied to both faces of the base paper to  
5 provide surfaces suitable for printing on both faces of the base paper.
33. A coated paper according to any one of Claims 1 to 31 wherein the first and second coatings are applied to one face of the base paper and the reverse face is coated with the second coating only.
34. A coated paper according to any one of the preceding Claims having  
10 information printed on at least one face of the base paper covered by a coloured abradable coating applied to the second coating and the abradable coating can be removed to reveal the information.
35. A coated paper useful for the manufacture of security documents substantially as hereinbefore described.
- 15 36. A scratch lottery ticket comprising coated paper according to any one of the preceding Claims.



Application No: GB 9505809.5  
Claims searched: 1-36

Examiner: Diane Davies  
Date of search: 15 December 1995

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.N): B2E: EM

Int CI (Ed.6): D21H 19/80, 19/82; 21/40

Other: Online databases: EDOC, JAPIO, WPI

**Documents considered to be relevant:**

Category	Identity of document and relevant passage		Relevant to claims
X,Y	GB 2217233 A	ECC Int. Ltd.) Whole document: paper for printing having two coats with different pigments.	1-36
Y	GB 2122545 A	(Coated Papers Ltd.) Whole document: security paper coated with an opaque layer.	1-36
X,Y	GB 2061764 A	(Hercules Inc.) Whole document: paper coated with two coatings, the first being mineral-based and the second containing an organic pigment.	1-36
X,Y	GB 0997912 A	(K.D.P. Papiers Keller Dorian & Putois) See in particular page 1 line 84 to page 2 line 29 for coating layers with different coloured compositions.	1-36
X,Y	GB 0700743 A	(Paper Patents Co.) See in particular page 7 lines 63 to 84 regarding coatings of different compositions.	1-36

X Document indicating lack of novelty or inventive step  
Y Document indicating lack of inventive step if combined with one or more other documents of same category.

& Member of the same patent family

A Document indicating technological background and/or state of the art.  
P Document published on or after the declared priority date but before the filing date of this invention.

E Patent document published on or after, but with priority date earlier than, the filing date of this application.



# The Patent Office

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**Application No:** GB 9505809.5  
**Claims searched:** 1-36

**Examiner:** Diane Davies  
**Date of search:** 15 December 1995

Category	Identity of document and relevant passage	Relevant to claims
Y	EP 0428489 A (Tumba Bruk AB) Whole document: lottery ticket paper comprising an opaque middle layer with an outer layer on each side.	1-36

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.